

## ABSTRACT OF THE DISCLOSURE

The present invention, generally speaking, provides a time shift angle demodulator that is of simple construction and has an extended linear range. Range extension is achieved by using the input signals directly, not simply post-processing the S-PFD outputs. In accordance with one embodiment of the invention, a method of measuring the phase or frequency of a periodic input signal uses a periodic reference signal and includes comparing the input signal to the reference signal to obtain a lead signal and a lag signal; changing the count of an up/down counter in dependence on the input signal, the reference signal, the lead signal and the lag signal; and using the lead signal, the lag signal and the count signal to produce a phase or frequency signal. In accordance with another embodiment of the invention, an apparatus for measuring the phase or frequency of a periodic input signal uses a periodic reference signal and includes a comparison circuit for comparing the input signal to the reference signal to obtain a lead signal and a lag signal; a logic circuit, including an up/down counter, responsive to the input signal, the reference signal, the lead signal and the lag signal to change the count of the up/down counter; and circuitry for using the lead signal, the lag signal and the count signal to produce a phase or frequency signal.

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